

ILLEGIB

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M/EB 318/64
15 June 1964
Copy 1

MEMORANDUM FOR: Chief, Defensive Systems Division, OSI
Chief, Forces Division, ORR

ATTENTION: [REDACTED]

THROUGH: Chief, Requirements Branch, Reconnaissance Group, CGS

FROM: Chief, CIA/PID (NPIC)

SUBJECT: Moscow Probable Phased Array Radar Facility (55-29-50N 36-41-10E)

REFERENCE: (a) Requirement C-DI-4-81,375
(b) CIA/PID Project C 813-64
(c) Report NPIC/R-218/64
(d) Vugraph AA-M64/36 Frame 19 (Confidential)

1. This memorandum is in response to your requirement dated 7 May 1964 concerning the Probable Phased Array Radar Installation near Moscow requesting:

(a) An artists drawing of the Probable Phased Array Radar structure (referred to as the "A-Frame" in this report since no official designation exists), and mensuration to include mesh size, face size, orientation of the faces, and angle of slope of the faces.

(b) A drawing with measurements and description of the control building including the possibility of electric power in the area.

(c) A line drawing of the installation showing all structures, roads, trails, power lines, security fencing, ground scarring, and unidentified activity.

(d) A description of the construction material stacked to the south of the "A-Frame" structure.

As a result of the telephone conversation between [REDACTED] on 27 May 1964, the portion of the requirement which requests a readout of the "new support area" has been deleted.

2. In the preparation of this memorandum, the terminology used in NPIC/R-218/64 has been used where appropriate. Mensuration presented herein was accomplished by the photo analyst, utilizing scale factors derived from mensuration performed by TID/NPIC. All dimensions are approximate.

Reviewed by NGA.

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5-12-819

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Facility (55-29-50N 36-41-10E).

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[redacted] photographed the Moscow "A-Frame" Installation on [redacted] furnishing high quality, but non-stereo photography of Operational Area A, and most support areas. Scattered clouds were present throughout the area, and completely obscured Operational Area B. As seen on this mission, the "A-Frame" is an inverted "V" shaped structure approximately 400 feet long (along the faces), 400 feet wide (across the ends), and 340 feet high. The faces slant upward toward a flat top which is approximately 90 feet wide. The angle of slope of each face is [redacted] from the vertical, [redacted] from the horizontal.* The longitudinal orientation of the "A-Frame" is 55/235 degrees, and the perpendicular orientation or look angle of the faces is 145/325 degrees. Basic dimensions of the structure are shown in Attachment 1.

The north-northwest face is an open, grid-like surface approximately 380 feet long, and 375 feet high (slant height). This open surface is subdivided vertically by 18 probably steel structural trusses, resulting in 19 vertically elongated openings. The edge definition of these trusses was not of sufficient quality to permit an accurate dimension of the trusses, or the spaces between, however the dimension of the spaces between trusses will probably be no greater than approximately [redacted]. No determination could be made from [redacted] concerning the number, size and spacing of the horizontal members in the face. On available ground photography, 15 horizontal members can be seen in the visible portion of the face. These members may possibly serve a function similar to roof purlins, however they may add structural strength to the face. A study is currently underway utilizing the complete series of ground photographs, and supporting technical data, to determine all critical dimensions possible.

On the lower edge of the north-northwest face is a linear light-colored strip which is probably panelling being emplaced (Item S, Attachment 2). This strip, which measures approximately 345 feet long and 45 feet high (slant height) appears light in tone, even though it is observed in shadow. The eastern end of this strip stops two open spaces short of the edge of the face, as shown in Attachment 2. The western end of the strip appears to extend to the limit of the face, but stops in a notched appearance, as though partially obscured by an object or piece of equipment. This strip was hidden from view on the ground photography because of trees.

The inverted "V" forming the western end of the "A-Frame" structure and the northern leg of the inverted "V" forming the eastern end were visible on Mission [redacted]. The inclined structural members forming the western end of the "A-Frame"

* It is interesting to note that the angle of slope of the face of the HEN HOUSE antenna at Sary Shagan (Radar Site 1) is approximately 25 degrees from the vertical or 115 degrees from the horizontal.

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appear to be more massive or solid in appearance than the visible inclined structural member on the eastern end. On available ground photography, the dark image which creates the massive, solid appearance definitely does not extend to the top of the structure on the east end, and probably does not on the west end. This would seem to indicate that this dark image represents something other than a main structural support, possibly surfacing material. The image here is considerably darker than that caused by the long linear strip found at the lower edge of the north-northwest face (Item S). Due to lack of contrast in the image, it was not possible to determine the edge separating the actual inclined truss from the possible surfacing material. Hence no width dimension has been included.

there was no evidence of construction scaffolding in the vicinity of the "A-Frame" structure. Nor was there any sign of the long, linear, possible wedge-shaped object which was present on the top of the structure on the top of the structure appears to be completely flat and smooth, except for one small unidentified object present on the northeast corner.

revealed the base and lower portion of two large tower jib cranes near the east end of the "A-Frame." One crane was completely in the shadow of the "A-Frame," while the other was in sunlight. From an analysis of the latter crane, it appears as though it is a travelling crane. If this is true, the orientation of the crane with respect to the "A-Frame" is such that it would travel within the structure, along rails parallel to the base of each face. Ground photography reveals that the tower portion of the crane is possibly low enough to make this feasible. Though the second crane is in shadow, two parallel striations meet the base portion of the crane in a manner suggesting rails. If these striations are rails, the second crane could traverse outside of the structure parallel and adjacent to the base of the north-northwest face of the "A-Frame."

An open area of unidentified activity, largely cloud-covered on is located on the north side of the "A-Frame." In the open portions can be seen one building (Item A, Attachment 2), possibly the foundation for another building, two identical patterns of unidentified activity, and unidentified ground scarring.

To the south of the "A-Frame" is an open storage area containing an extensive number of large crates. For the most part, these crates fall into two general sizes and shapes. The first type (Item C) make up the center of the stack and measure approximately 20 feet long, by 10 feet wide. On the west end, a large

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cover has apparently been thrown over the stack. Item C is higher than Item B although it could not be determined whether this was a single or multi-level stack. Item B is positioned around the periphery of the stack, and also lined up closely in several additional rows. These crates are approximately [REDACTED] [REDACTED] Approximately 75 of each type of crate is visible. The remainder of the material in the storage area appears to be miscellaneous clutter.

To the west of the "A-Frame" structure is located the large flat-roofed control building (Item K). This building is approximately 520 feet long, 175 feet wide, and 65 feet high. Longitudinally, the building is subdivided by suspect masonry walls, into four equal sections or bays, each measuring approximately 130 feet and 175 feet.

On the eastern edge of the building roof is located a small structure (Item J) measuring approximately 25 by 20 feet. Along the center dividing line of the roof are two and possibly three more small structures (Items L, M, and N). The first measures approximately [REDACTED] feet, and no dimensions could be derived for the third.

The north wall of the control building was the only one visible on [REDACTED] [REDACTED] Though observed in shadow it appears to be a solid wall, with no openings. While the east end of this wall appears quite regular and vertical, the west end appears ragged, as though construction is still in progress.

At the west end of the control building is a probable hardstand. Located thereon are at least two large box-like objects which are either small extensions to the building, or large crates placed up against the building (Items P and Q). These measure approximately [REDACTED] and 20 by 15 feet. At the northwest corner of the control building is a flat-roofed structure 125 feet long, by 60 feet wide, and 25 feet high (Item R). This structure has been referred to as an annex to the control building. It cannot be determined whether or not the two buildings actually join, though it is suspected that they do not. The width stated for this building is the width of the visible portion only, and thus possibly may be short of the true width. The north wall of this building is the only visible wall on [REDACTED] and is partially obscured by shadow and cloud. The roof of this building appears to have structural work for a second level. A discrepancy exists in the relationship between the number of horizontal and vertical members, and the number of shadows which are cast, or should be cast, by these members. This may be due to the fact that the second level structural work has already been erected and covered on the near edge of the building, so that the shadows from the remaining members are obscured by this section. This question cannot be resolved without stereo photography of the facility. In the absence

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of more precise interpretation of these features, no dimensions have been included. The activity seen on and around this building does not presently suggest any relationship with electric power. To the west of this building (Item R), extending for most of the length of the control building are stacks of building material, probably lumber.

On the south side of the control building is a flat-roofed building (Item H), measuring approximately 250 feet long, 45 feet wide, and 15 feet high with an extension on the east end (Item G) which measures approximately 80 by 30 feet. The roof of the building has a corrugated appearance, and tonal variation along several of the corrugations suggests that the building, or at least the roof, may be made up of four sections, approximately equal in length. The outlines of the extension to this building are not well defined. It gives the impression of possibly being rounded along the roof line, like a quonset hut. At the opposite end of the building are stacks of building material, probably lumber.

To the southeast of this flat-roofed building are two smaller buildings (Items E and F). These buildings were present on [redacted], although they were extremely difficult to detect. Beyond these two buildings is a probable third building (Item D). These buildings measure approximately 70 by 40 by 15 feet, 75 by 25 [redacted]. The first two are gable-roofed and the third is probably flat-roofed. None of the buildings appear to be permanent in nature and may be construction support buildings, or sheds.

The "A-Frame" installation and the immediate surrounding area are depicted in a small scale line drawing, in Attachment 3.

3. From a quick analysis of the complete series of ground photographs two significant differences in interpretation appear. First concerning the number of vertically inclined structural trusses, it can be determined that 19 trusses are present, forming 20 vertically elongated openings, rather than 18 trusses forming 19 openings. Second, it can be seen that the dark image at each end of the "A-Frame" is caused by some form of surfacing material. On the eastern end of the "A-Frame" this surfacing material has thus far been applied only to the end surfaces. The surfacing material on the north leg of the east end of the "A-Frame" protrudes a discernible distance out past the external edge of the structural trusses which form the north-northwest face (see Attachment 5). The roof line also protrudes, or overhangs, the north-northwest face approximately the same amount as the surfacing material.

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From [REDACTED] the shadow cast from the south leg of the east end of the "A-Frame" meeting the roof indicates that the roof overhangs at that location also. This effect is not present on the west end, probably since the protruding surfacing material has been implaced all the way up, and meets the overhang in the roof creating a smooth corner. On the west end of the "A-Frame" this dark surfacing material appears to have been applied both to the end surfaces (giving the 70 feet in width appearance), and to the west edge of the south-southeast face. (The ground photographs were received after the memorandum was complete, consequently the analysis in Paragraph 3 was done subsequently and inserted into the memorandum at the last moment.)

4. The following attachments are enclosed herewith:

- (a) Attachment 1 - orthographic drawing of "A-Frame" structure
[REDACTED]
- (b) Attachment 2 - annotated artist's drawing of Operational Area A, unrectified
[REDACTED]
- (c) Attachment 3 - line drawing of the Probable Phased Array Radar Installation and immediate surrounding vicinity, unrectified
[REDACTED]
- (d) Attachment 4 - photograph of radar, [REDACTED]
[REDACTED]
- (e) Attachment 5 - line drawing showing outline of surfacing material on east end of "A-Frame" [REDACTED]

5. The photo analyst on this project is [REDACTED] who may be contacted on extension [REDACTED] should you have any further questions concerning this project.

6. This project is considered to be complete and a pending published report incorporating both this and additional information satisfying Requirement N 569/64 will be forthcoming.

Enclosures: (referenced above)

- 1 - Four drawings
- 2 - One photograph

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Moscow Probable Phased Array Radar
(55-29-50N 36-41-10E)

25X1
25X1
25X1

25X1
25X1

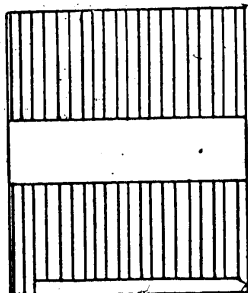
Note: Mensuration accomplished from [] indicates:

a. The angle of each face is [] from the vertical, and [] from the horizontal.

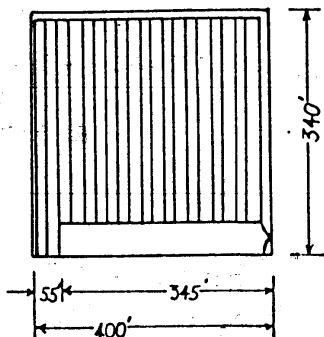
b. The width of both legs in end view is equal

Note: Linear dimensions presented hereon, and elsewhere in this memorandum are accurate within [] 15 feet, whichever is greater. angle of slope of faces is accurate [] degrees.

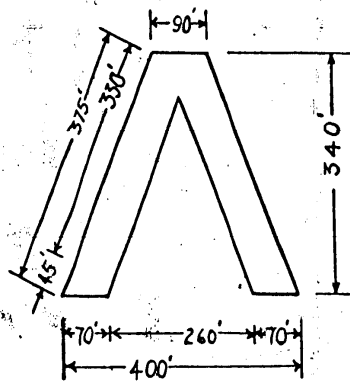
25X1



Top View



Side View



End View
(West End)

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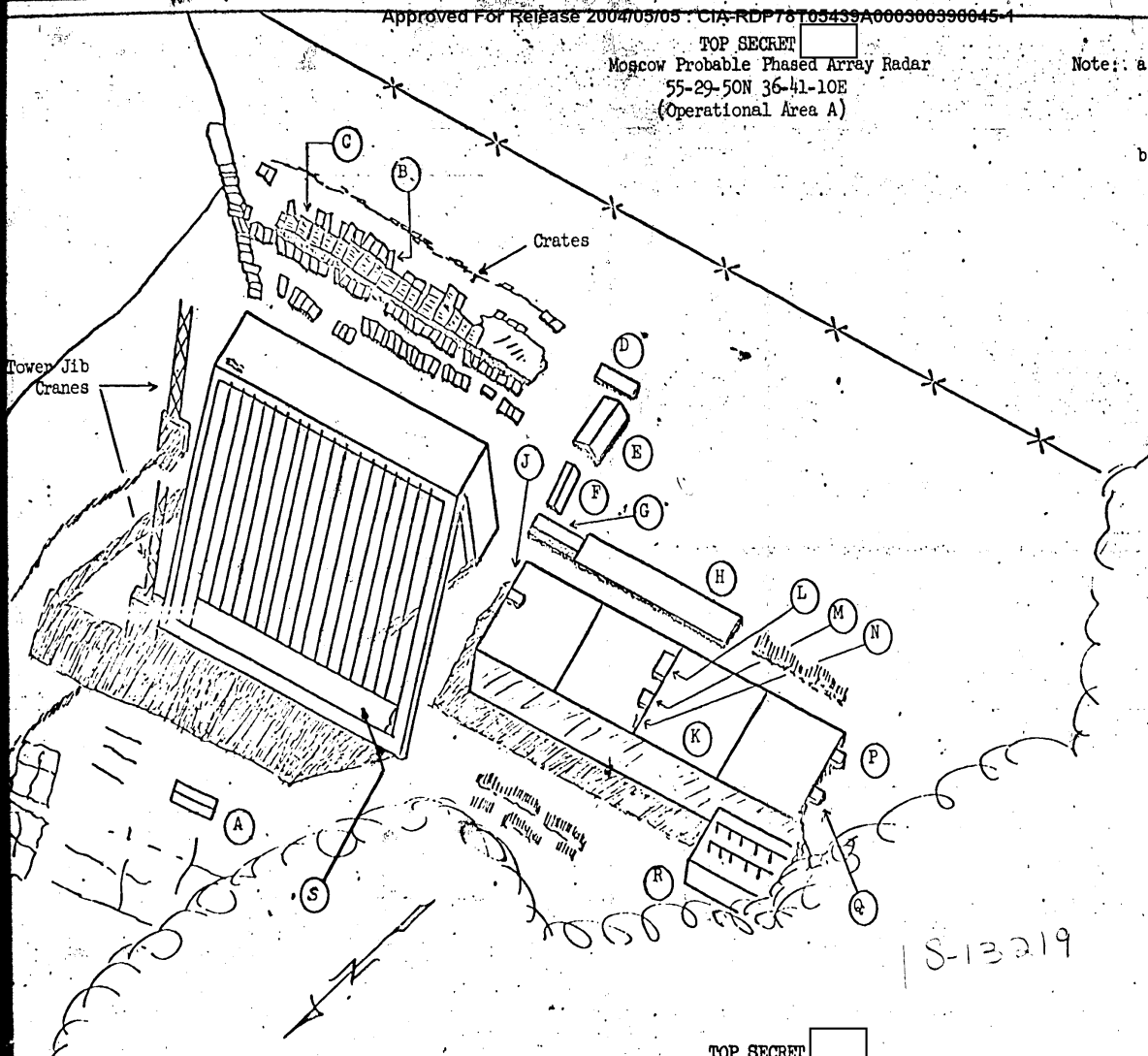
25X1

Attachment 1.

25X1

TOP SECRET
 Moscow Probable Phased Array Radar
 55-29-50N 36-41-10E
 (Operational Area A)

Note: a. This drawing was accomplished from unrectified photography of 25X1
 b. Due to the obliquity involved, mensuration was not performed on the northern upright of the west end of the probable phased array radar, As viewed on the width of this upright appeared foreshortened. 25X1



DIMENSIONS (in feet)			
Item	Length	Width	Height
A	65	30	25X1
B	20	10	25X1
C	60	10	25X1
D	70	40	15*
E	75	25	
F	80	30	
G	250	45	15
H	25	20	25X1
I	220	15	25X1
J		15	25X1
K	25		
L	20	15	
M	125	60**	25
N	345		45

*Height to the eaves
 **Visible extent of building width

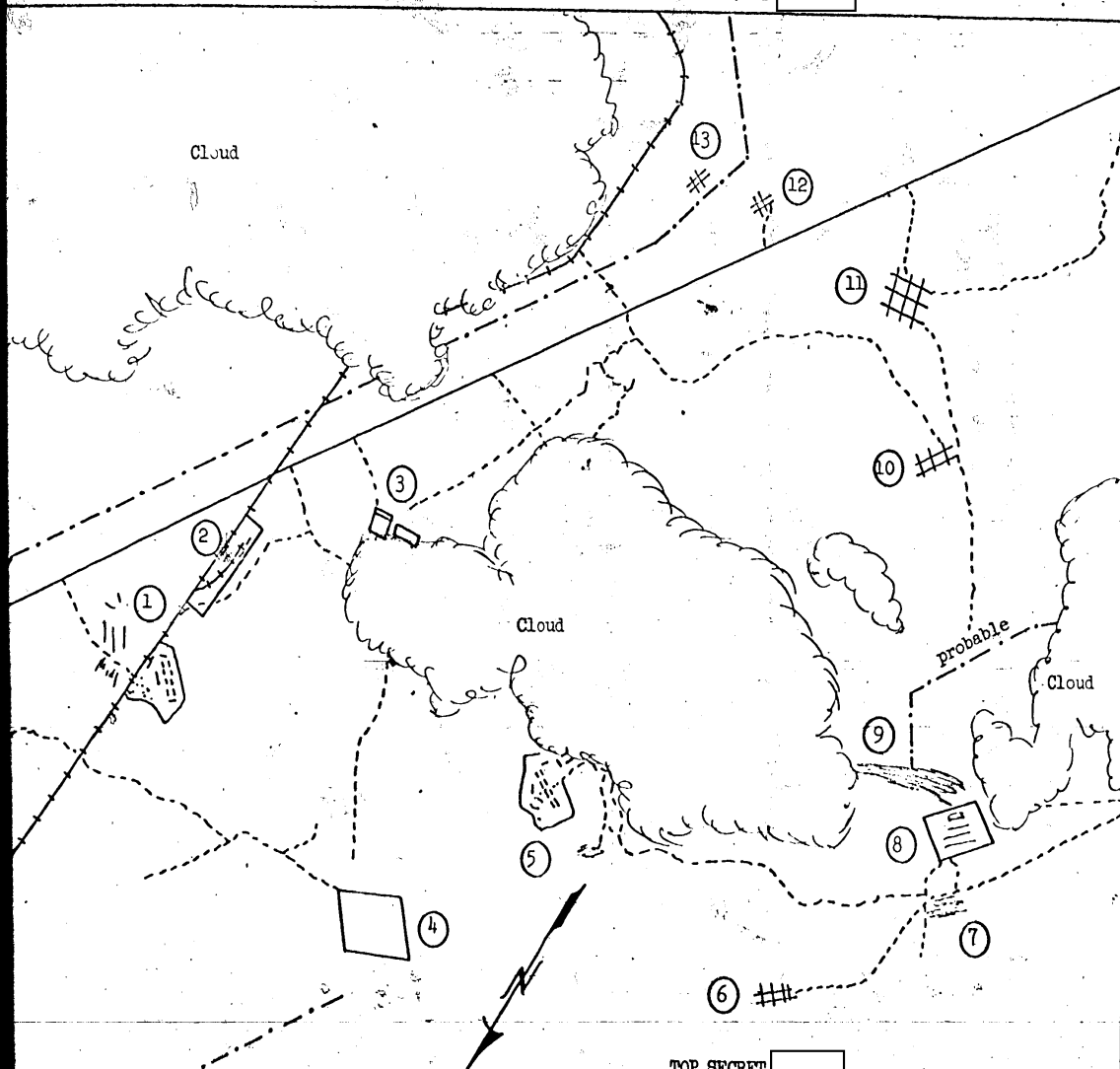
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Attachment 2.

25X1
 25X1

TOP SECRET

25X1



Moscow Probable Phased Array Radar and Surrounding Area

—— Main Road
 ---- Secondary Road
 Power Line or Trace
 ++++++ Rail Line

1. Support Area B
2. Rail spur and transshipment point.
3. Operational Area A (Probable Phased Array Radar)
4. Unidentified Area
5. Support Area A
6. Village or settlement
7. Ground scarring
8. Substation
9. Ground scarring
10. Village or settlement
11. Village or settlement
12. Village or settlement
13. Village or settlement

Note: This drawing has been 25X1
 accomplished from unrectified
 photography of

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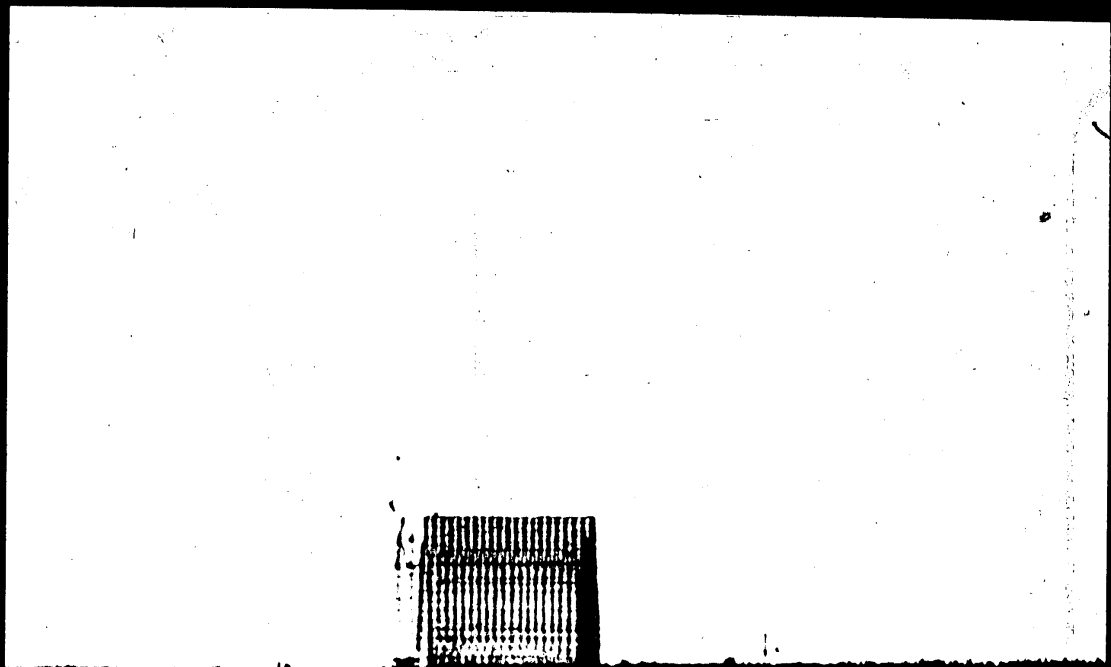
TOP SECRET

Attachment 3.

25X1

25X1

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MOCOW ANTENNA
35m. SW. at 5529N 3641E
[Redacted]
Attachment 4

TOP SECRET

25X

Note -- drawing is not drawn to scale.

Visible overhang of roof

External edge of framework

Protruding surfacing material

South leg

East end of "A-Frame"

North leg

Attachment 5.

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25X1

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IS NO. 281/64

16 June 1964

Copy No. 1

MEMORANDUM FOR: Chief, Resources Division, ORR

ATTENTION :

THROUGH : Chief, Requirements Branch, Reconnaissance Group, CGS

FROM : Chief, CIA/PID (NPIC)

SUBJECT : Search for the Feng-huang-shui Dam and Hydroelectric Power Plant

REFERENCES : (1) ORR Requirement No. ORR/41/63
(2) CIA/PID Project No. C 755/63

1. This memorandum is in response to the above referenced requirement which requested the location, description and expansion since 1958 of the Feng-huang-shui Dam and Hydroelectric Power Plant located in Communist China.

2. The only dam identified near the referenced coordinates (23 50N - 116 40E) was a small probable flood-control dam located at 23 53N - 116 39E. There is a larger dam with hydroelectric power facilities 10 nm from the reported location. This dam is located at 23 54N - 116 52E. This is probably the Feng-huang-shui facility; at any rate this is the only activity of this nature that appears to answer the requirement within a 20 nm radius of the reported location. Photographic enlargements of this facility dating from 1958 to 1963 have been included as attachments to this memorandum (See Figures 2-6).

3. There was no evidence of any dam or construction scarring of any type at the site in 1958. The next photo-mission to cover the area was in 1962 and the dam and associated activity appeared to be in mid-to-final stages of construction. The photo coverage of 1963 revealed advanced construction stages, most units operating, and a high water level in the reservoir. The dams appear to be a combination of earthen and concrete type construction. Judging from the dam construction and the power facilities identified at the site, the primary function of the dam appears to be for flood control and the power aspects only minor or secondary. There are two generating stations and one possible generating station. One generating area is located near the long spillway portion; this is served by a canal and penstocks. The other is a small struction located near the large earthen dam portion, which is served by a canal from the small spillway. The possible generating building, or more proper, unidentified structure is situated on the reservoir side of the dam above the large spillway. This is a large building several

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stories high which may contain generating equipment, or research-type equipment or activity. The chronological development of this dam and power activity is as follows:

- 25X1 a. [REDACTED] (See Figure #2) - There was no evidence of any construction activity that could be related to the facilities as they appeared on later photography. Two different sizes of photography were included: one to show as much of the river valley and the site of later construction (the contact print); and the photo-enlargement showing where the construction areas appeared on later photography.
- 25X1 b. [REDACTED] (See Figures #3 and #4) - Two photo-missions covered the dam site during the month of [REDACTED]. These were flown on the [REDACTED]. Although the time span is short, enlargements from both missions have been included to show the details of the subject structures with comparative high and low sun angles. This is the first overflight coverage that revealed the presence of this dam and hydroelectric power activity. The construction appeared to be in mid-to-final stages; most of the external construction was completed. The east section of the dam and the small probable generating building was completed and operating. One penstock appeared complete at the generator hall located between the two sections of the dam; construction was underway on a second penstock; the canal leading from the dam to the penstock appeared completed. The unidentified structure on the reservoir side of the west section of the dam, is probably for gate control and/or research and not for generating purposes. This is a rather large structure and there is no evidence of any substations, switching gear, pylons or any other form of power transmission facilities associated with it. The spillway in the west section is unusual. This probably is due to the narrow stream bed leading from the dam to the wider channel to the east, the water must be slowed down to reduce the erosive effect of the direct unrestricted flow.
- 25X1 c. [REDACTED] (See Figures #5 and #6) - The dam and hydroelectric facilities appeared essentially as they did in [REDACTED]. The major change in the area is the height of the reservoir behind the dam. The large building above the west spillway appears to be the same as it did in 1962. A second penstock appears completed at the generator hall located between the two sections of the dam. The small probable generator building near the east section of the dam, appears essentially the same and water appears to be flowing from underneath the building toward the river. The construction activity at this time appears to be in either a final stage or completed.
- [REDACTED]

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4. The analyst assigned to this requirement was [redacted] who may be contacted on extension [redacted] should any questions arise concerning this memorandum. This memorandum and attachments completes this requirement.

ATTACHMENTS:

- 1 Annotated Map [redacted]
- 5 Annotated Photographs [redacted]

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